

The Application of Information Superiority to a Joint Task Force Headquarters

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Abstract

Conceptual documents like *Joint Vision 2010 (JV 2010)*, the *Concept for Future Joint Operations (CFJO)*, and the *Revolution in Military Affairs (RMA)* postulate that advances in technology and information superiority will revolutionize the way military forces operate early in the 21st Century. The battlespace of tomorrow will be marked by more lethal weapons possessing greater accuracy and longer ranges; a higher tempo of operations with dispersed forces and increased mobility; greater situational awareness of the Joint Operational Area; organizational changes to military units; and better trained and equipped personnel. The impact of these changes suggests different alternatives for organizing the joint force headquarters. It addresses the key question: Is the present method of forming, organizing, and employing the Joint Task Force (JTF) Headquarters (HQ) adequate to command and control tomorrow's joint forces? If the answer is no, then how can technological innovations improve upon this function.

1.0 Introduction

This paper is built on the premise that modern and emerging technologies – particularly information specific technologies – should make possible new, more efficient, more effective ways to organize a joint task force headquarters. First, we need to see what capabilities information superiority is expected to bring to the table; to identify some of the emerging technologies that will affect future military operations; to briefly describe how these technologies will change the way US forces will conduct military operations in the future; and then end with a short description of how technology will affect the command and control of those forces at the operational level.

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1.1 *Information Superiority*

Underlying a variety of technological innovations is information superiority –the capability to collect, process, and disseminate an uninterrupted flow of information while exploiting or denying an adversary’s ability to do the same. Information superiority is the key enabler for the command and control (C2) function. Optimum C2 in the early 21st century will depend on seamless communications, all-weather real-time sensors, current and accurate data-bases, and the resulting near-real-time situational awareness for the Joint Force Commander (JFC) and the entire chain of command. Key to the availability of information is the Global Information Grid.

The Global Information Grid (GIG) is the globally interconnected, end-to-end set of information capabilities, associated processes and personnel for collecting, processing, storing, disseminating and managing information on demand to warfighters, policy makers, and support personnel. The GIG includes all owned and leased communications and computing systems and services, software (including applications), data, security services and other associated services necessary to achieve information superiority. The GIG also provides interfaces to coalition, allied, and non-DOD users and systems.¹

During the execution of future joint operations, our advanced information systems will provide an increasingly accurate, timely, and relevant common view of the battlespace that will allow leaders at all levels to more fully leverage the capabilities of the force and achieve a tempo of operations that will overwhelm any opponent. This unprecedented level of battlespace awareness will permit leaders to operate more effectively within the commander’s intent and to act in the absence of direct control.

As we achieve information superiority, the joint force commander will be able to vary the degree of control based on the current situation (rules of engagement, political constraints, etc.). Although the potential will exist to centralize the execution of future joint operations, appropriate decentralization will more fully exploit the capabilities of agile organizations and the initiative and leadership at every level. The future commander must resist the temptation to centralize execution authority when it is not warranted.

Information superiority also will allow future JFCs to become more mobile. Remote connectivity will allow many staff functions to be accomplished in a single, fixed location, even as the commander moves throughout the battlespace. Protection and logistics requirements can be reduced if the bulk of the JFC staff operates from a remote and secure area, perhaps even from CONUS. The “virtual staff meeting,” with all participants interacting as if they were in the same room, should permit the JFC to be extremely mobile and physically accompanied by a very small number of the staff.

The *JV 2010* precept of massing effects from widely dispersed forces will require a new perspective on the best place from which to lead since, in most cases, “the front” will not be defined. The JFC’s mobility, while continuously “seeing” the battlespace, making decisions, and

¹ This definition was provided in a September 22, 1999 Memorandum from Mr. Arthur L. Money, Senior Civilian Official in the Office of the Assistant Secretary of Defense, C3I

providing direction, may actually enhance the ability to fulfill leadership requirements. The JFC will be able to visit forces dispersed throughout the battlespace without degrading the C2 function. The JFC will have continual near-real-time situational awareness regardless of location, allowing the freedom to be where instincts lead.

The unqualified importance of information will not change in the future. What will differ is the increased access to information and improvements in the speed and accuracy of prioritizing and transferring data brought about by advances in information technologies. While the friction and the fog of war can never be eliminated, new technologies promise to mitigate their impact.

1.2 *Technological Innovations*

In addition to the explosion of information technologies, other developing technologies will have major impacts on future military operations. Some of these technologies include high-powered electrical generation; alternative power sources; miniaturization; directed-energy weapons; computing, communications; electronic/information warfare; electronic devices; biotechnology; structural materials, human factors and man-made interfaces; precision attack; automation and robotics. Some uses of these technologies show up as advancements in:

- **Platforms:** There will be advances in unmanned aerial vehicles (UAVs) that will permit these platforms to orbit over hostile territory with weapons and/or sensors onboard. High Altitude/Long Endurance (HALE) UAVs will be able to orbit for days over enemy territory at very high altitudes making them difficult to target. Advances in micro-electro-mechanical technologies are allowing the construction of miniature six-inch aircraft that can be used for reconnaissance and surveillance, battle damage assessment, targeting, sensor placement, communications relays, or sensing chemical, nuclear, or biological substances. Low observable/masking technologies (LOMT) are applying stealth technologies to all types of vehicles/weapons making them less observant to the enemy. Ground unmanned vehicles (GUVs) will be able to roam behind enemy lines, be used in urban situations, or even wander through buildings and structures taking a variety of sensors with them.
- **Targeting:** Over the next decade, total ISR capability will be melded into a system-of-systems architecture which ties national/theater/tactical sensors, commanders, and shooters together to enable U.S., allied, and coalition forces to strike rapidly and decisively at extended ranges. Advances in sensor-to-shooter technologies will expedite the targeting process.
- **Sensors:** There will be a variety of new sensors to compliment today's sensors. They will include the ability for advanced target tracking, foliage penetration, deep penetrating radars, Chem/Bio detection, and wide-area search, and advances to moving target indicators.
- **Kinetic Weapons:** There will be incremental improvements to present-day precision and non-precision weapons which will improve range, accuracy, lethality, and reliability. New weapons systems may include hypersonic, standoff weapons, long-range guns, directed-energy weapons, and electro-magnetic guns. Next generation explosives and advances in miniaturization technologies will allow smaller precision weapons to be built with the destructive power of much larger weapons.

- **Non-Kinetic Weapons:** A growing field of weapons, with many uses, they include anti-traction materials, sticky, odorous foam, high-powered microwave, robotic ambush, riot agents, and calmatives to name a few.
- **Offensive Information Operations (OIO):** There will be major improvements in some areas of OIO to include electronic warfare, military deception, and computer network attack. New devices may be created to disrupt data flow or damage entire computer systems, hardware and all. Among these are High Energy Radio Frequency guns, which focus a high-power radio signal on targeted equipment, thus disabling it; and Electromagnetic Pulse devices, which can be detonated in the vicinity of a system and destroy electronics and communications equipment over a wide area.
- **Logistics:** Developments in Automatic Identification Technology (AIT) integrated into automated information systems (AIS) will enhance automated tracking of assets worldwide. Equipment with built-in diagnosis equipment will be able to warn users of impending component failures. Maintenance manuals will be built into the vehicles to assist operators in maintaining and /or repairing their vehicles. Various technologies will allow designers to reduce crew size, which in turn reduces logistical support for personnel.
- **Mobility:** Lightweight composite materials will permit lighter, yet stronger equipment, which helps fuel-economy and shipping weight. Advances in alternate power sources and engine technologies including high breed internal combustion/electrics will lead to more economical operations. The development of tilt-rotor aircraft will provide aircraft that can carry personnel and/or equipment to more locations, at longer ranges than ever before.

Rapid advances in these key areas are creating warfighting and support capabilities far exceeding those of today. Recognizing the opportunities presented by these sophisticated innovations is a challenge in itself.

1.3 Future Warfighting

These new technologies are creating warfighting and support capabilities far exceeding those of today. They will allow the US to conduct rapid, decisive operations throughout the range of military operations. In recognition of this new capability, numerous Joint, CINC, Service, civilian academic and contractor “think-tanks” are developing new concepts designed to take advantage of these technologies. For example, the Joint Advanced Warfighting Program (JAWP) is developing a *Joint Strike Force (JSF)* concept; the US Pacific Command is developing a *Joint Mission Force (JMF)* concept; and the US Joint Forces Command is about to begin to experiment with three different concepts: its own *Rapid Decisive Operations (RDO)*, IDA/JAWP’s *Joint Rapid Operations Force (JROF)*, and DGI’s *Rapid Dominance (RD)*.

The RDO concept is typical of the new concepts, and provides a good description of how warfare will change as a result of some of these technological changes. The RDO concept postulates that power projection and forward presence will likely remain the fundamental strategic concepts of our future force. Power projection will enable the timely response critical to our deterrent and warfighting capabilities. Forward presence facilitates power projection and sends a clear signal of US commitment and resolve. RDO builds on these concepts by calling for a highly deployable, lethal, agile, survivable, and supportable joint force which can rapidly defeat an adversary’s operational and strategic centers of gravity in order to force the adversary

to do our will. The essence of the concept emphasizes situational understanding, immediate response capability, speed, and massing of effects rather than forces.

RDO combines technology and innovative functional concepts to develop an adaptive joint force that presents a smaller physical and electromagnetic footprint, achieves rapid extended operational reach, and generates high-tempo operations. Precision engagement capabilities are significant. These capabilities increase the joint force's requisite lethality and are enabled by flexible options for staging and insertion of forces and synchronizing support to the battle rhythm while reducing deployment and sustainment requirements. Additionally, RDO calls for increasing the joint force's protection by reducing the exposure of the joint force to adversary action. Fused networked sensor packages and a robust information infrastructure, combined with advanced planning and decision support tools, provide commanders and staffs at all levels a common relevant operational picture (CROP) that increases battlespace awareness and enhances joint command and control.

These capabilities allow the JFC to attack centers of gravity directly, preempting the adversary's ability to operate from a positional advantage or threaten the joint force. This ability to operate within an adversary's strategic and operational decision cycles forces the adversary either to quit the conflict or to continue at a decisive disadvantage. If the adversary does not quit the conflict, the JFC can continue to employ an increasing volume of precision effects and deploy dominant maneuver forces directly into a combat posture. Both the JFC's combat and support forces possess the capabilities that allow the JFC to employ these lethal, highly mobile, and tailorable units over great distances. Deployment is in days and weeks versus months. Support is tailored, streamlined, anticipatory, and focused with quick reachback and reachout capability. Use of non-traditional mobile operating bases and platforms will be required when initially denied access or lodgment. Agile support reduces lift and distribution requirements while increasing force protection. After achieving decisive results, the JFC can quickly tailor the joint force for stabilization operations or, deployment to other contingencies, or redeployment to home station.

This discussion brings us to the topic of this paper. Are today's procedures for forming, organizing, and running a joint task force headquarters adequate to control this high-tempo, dispersed force?

1.4 *Today's JTF Headquarters*

The JTF HQ provides the means for the JFC to "see" the battlespace, decide what must be done, pass instructions or orders, ensure the decisions are carried out and assess the results. JTF HQ are typically formed around an existing Service component headquarters or by forming a new headquarters, ad hoc, the personnel coming from a various of sources.² The headquarters is typically organized in the Napoleonic style with J1 through J6 divisions. No two headquarters are alike as the JFC organizes his headquarters as necessary to carry out all duties and responsibilities.

² Joint Publication 5-00.2, "Joint Task Force Planning Guidance and Procedures", 13 January 1999, page II-2.

Today, JTF HQs are often formed ad hoc after a crisis has occurred. Organized by the JFC to accomplish the mission based on his vision and concept of operations, the headquarters are often hurriedly made up of personnel drawn from numerous sources. Personnel most often have not participated in courses of action planning and arrive untrained and/or unprepared for the mission. Sometimes personnel may be sent directly to the joint operational area and be expected to perform immediately, without much benefit of training or exercising. They often use equipment that was built for single-purpose, stand-alone applications that is often unique to a particular Service. This presents a formidable challenge -- forming a smoothly functioning cohesive headquarters quickly, at the very time when demand for rapid, coherent planning is at its height, early in the crisis. Many question whether this method of creating, manning, organizing and employing a joint force headquarters can cope with the rapid, high-tempo, information dependent forces of tomorrow.

1.5 The Possibility for Change

Information technologies offer new capabilities that will make possible major improvements in the way we form and organize our JTF HQs. Improvements such as reachback capabilities, standing joint force headquarters, and re-organizing the staff should improve the effectiveness and efficiency of the C2 function. Reachback recognizes that as information technologies mature, commanders will be able to split their headquarters into a small "forward" headquarters consisting of the commander and his key staff. They are supported by a much larger "rear" headquarters located hundreds, maybe thousands of miles away, out of the joint operational area (JOA), out of "harm's way". People in the forward headquarters would be connected to all of the rear headquarters via a secure, virtual network. Key personnel in the forward headquarters could arrange a virtual meeting with other personnel in the rear headquarters, or anywhere in the world through the GIG. Likewise, other people in the rear headquarters, or elsewhere could contact personnel in the forward headquarters as necessary.

So far this paper has been discussing a JTF HQ. A Task Force is defined as "a temporary grouping of units, under one commander, formed for the purpose of carrying out a specific operation or mission."³ Hence a Joint Task Force is a task force composed of two or more military departments. The keywords in the definition of a task force are the terms "temporary" and "formed for ... carrying out a specific operation or mission." JTFs are specially formed units designed to perform a single operation and once that operation is complete, the JTF is disbanded. The following concept calls for establishing Standing Joint Force Headquarters (SJFHQ). A SJFHQ differs from the JTF HQ because the SJFHQs are full-time, "standing" headquarters. They are not formed ad hoc, nor are they disbanded once an operation is over.

The SJFHQ concept calls for establishing full-time Joint Force Headquarters at, or near, each warfighting CINC's headquarters. No longer would we have ad hoc joint headquarters except in special or unusual situations. The standing Joint Force Headquarters would be manned by a full-time, dedicated joint staff that acts as the "core" of an actual joint force headquarters. This organization would be trained to handle any contingency throughout the range of military operations. Personnel assigned to this organization would serve as the "process owners" of a JFC's Joint Force Headquarters. The Standing Joint Force Headquarters could be used three

³ Joint Publication 1-02 "DOD Dictionary of Military and Associated Terms", 10 June 1998, page 448.

ways: it could be broken up into core “plugs” to support a Service JTF Commander; it could stand by itself as a JF headquarters during small contingencies; or finally it could provide the backbone of a major joint force headquarters during larger contingencies.

Finally, information technologies may facilitate a new way of organizing within the Joint Force Headquarters. Instead of the traditional Napoleonic J1 through J6 organizational structure, information technologies may lead to a headquarters organized around functions like protection, effects, information, planning, and logistics. These new concepts may lead to more efficient, more effect joint headquarters for tomorrow’s forces.

2.0 How Information Superiority Can Influence the Primary Functions of Today’s JTF HQs

The JTF Headquarters staff exists to support the commander. To accomplish this, the staff generally performs four primary functions:

- Analyze the situation and need for action
- Determine the course of action best suited for mission accomplishment
- Carry out that course of action, while
- Continuing to assess the unfolding situation

The following sections will describe how information technologies will affect each one of these functions.

2.1 Analyze the Situation and Need for Action

This function deals primarily with gathering, analyzing, and distributing information. Information is the essential element of command and control. Key to this function is the GIG which contains two types of information: collected information and real-time information. Collected information is that information that is placed in the GIG much like books in a library. For example, there would be reports, studies, analyses, maps, videos, etc. that could be accessed through a series of indexes. If a user wanted information on a particular military unit located in country Orange, all he/she would have to do is find country Orange on the “Country Index.” Country Orange’s index would then appear and the user would choose from categories like economy, culture, religion, military, politics, etc. The user would select “Military” and again have a series of choices such as units, weapons, doctrine, leadership, locations, etc. By continually digging deeper and deeper, the user will find the unit he is interested in. A faster way to find information would be us use the powerful search engines that would be included in the GIG.

To keep the information current and relevant, an agency would have to be created to act as the “librarian.” Information would be catalogued, dated, and referenced by source. A “review-by date would be given (6 months, a year, etc) to each piece of information, so when that date arrived, the information would be highlighted and the responsible agency would have to review the date to determine if it should be removed, or updated. If the information were updated, a new “review-by” date would be given to it.

Classified data would also be available on the GIG. Intelligence data would be provided in much the same manner as unclassified data, but only be available to those with a “need-to-know.” Classified information would also have a central “librarian” to ensure the same currency and relevance as unclassified data.

The second type information carried on the GIG would be real-time information. This information would come from networked sensors that feed powerful computers, which produce pictures of the battlespace. There would be an air picture, a land picture, a sea picture, and even a space picture. It would be possible to combine them if desired. For example a commander may want to view the air and ground picture of a certain area simultaneously. Users could zoom in to see greater detail, or zoom out to see the larger picture. If the user wanted to know which sensors provided the data, or how many, their locations, or the time the data was provided he would click on an icon and that information would be displayed on the monitor.

Other real-time inputs might include various warning messages such as a TBM launch or an aircraft loss. Real-time weather would be available as would selected national and international newscasts.

All of this data becomes information when processed into usable forms such as reports or images. This information is transformed into knowledge by purposeful analysis, interpretation, and collation with related information and background to meet the specific need of the user. When the warrior’s judgment is applied to this knowledge, understanding of the battlespace is achieved. This high degree of timely, accurate, relevant, usable, complete, and succinct information will allow for an unequaled level of effective planning and execution of military operations.

Fundamentally, the choice of information should be with the commander or warrior who wants or needs it. The commander specifies what information he needs, which elements of the specified information are critical to mission accomplishment and prioritizes the critical elements by time, phase, or other criteria, through his Commander’s Critical Information Requirements (CCIR). Distinguishing his CCIR from all available data expedites the flow of information, maintains a high tempo of operations, and most importantly, keeps the commander and staff proactive. Therefore, a fused all-source solution must incorporate a sophisticated and effective combination of “push” and “pull” information. “Push” information is that information that the commander has requested and is automatically provided to him. “Pull” information is information that may be desired sporadically and is not normally pushed to the user. An example of “pull” information may be information on the characteristics of a certain weapon. That information is not normally provided, but is available in the GIG.

Generally, the information system should be comprised of a set of interconnected communications and sensor systems, software applications, and organizational structures that will provide:

- Secure and responsive information that is available to all users when needed.
- Accurate and timely display of enemy locations and activities.

- A comprehensive catalogue of, and access to, networked data bases relating to the operations area and adversary capabilities.
- Accurate, real-time friendly location and combat status, and neutrals.
- The capability to support split-based operations from force projection locations throughout the battlespace.
- Near-real-time processing of information to allow for a common operational picture of the battlespace.
- Multilevel security access to allow sharing of information with a wide variety of military and non-military partners
- Data and information that has been tagged for automatic releasability.

The battlespace information systems of the future will enable leaders to fuse the intuitive process with cognitive tools and automated decision aids in ways that will yield a much-improved visualization of the battlespace in space and time. This fusion will enable collaborative and simultaneous efforts from local and remote organizations to solve complex battlespace challenges. While organizations and staffs may become more widely dispersed, their efforts will become more focused.

2.2 Determine the Course of Action Best Suited for Mission Accomplishment

Current planning and execution methods used by our joint forces can be considered to be the state-of-the art. Even our closest allies have difficulty maintaining our pace during operations. This current information advantage is not permanent and could be lost if we don't continually update our information capabilities and processes to use them.

Planning is an intensive information management activity. Currently, strategic and operational planning methods use large, redundant staffs that are organized into distinct groups of functional experts to perform either deliberate or crisis action planning and execution. Functional groups within the joint force and subordinate and supporting commands must wait out the results of the higher-level planning process before many lower-level planning steps can begin. Planning for the most part is linear and sequential.

Currently, most mission planning and battle management processes are stovepiped systems defined by different CINC, Service, command-level, mission, and functional area requirements. Higher-level commanders have limited capability to visualize the relationship of lower-level plans to higher level objectives. Lower-level commanders often do not have complete understanding of how their specific mission plans contribute to achieving overall campaign objectives. There exist separate and multiple software applications, which have limited ability to exchange information due to differences in data formats and plan representations. Collaboration among warfighters for interrelated elements of the overall plan is not well supported, making coordination a time-consuming process. Execution is not integrated with the planning process. Warfighters do not always have the ability to monitor the status of execution relative to the plan. After a performance measurement, the plan can be adjusted and re-planning accomplished to take advantage of opportunities. The tempo of operations is further inhibited by information overload, which now can overwhelm even our best warfighting staffs if not controlled and focused. The range of military operations is increasing in complexity and intensity. Allowing

less time to monitor, assess, plan and execute decisions. In order to stay ahead of a complex and shifting global environment, joint forces must improve the “speed of command” and increase the “unity of effort” to be able to dominate any future battlespace.

USJFCOM’s concept for Joint Interactive Planning⁴ (JIP) states the JFC will conduct joint operational planning utilizing three basic elements. First, an “interactive joint planning group” (JPG) which is both virtual and collaborative. Second, an “adaptive, tailored planning process” that will integrate and synchronize the JTF staff, subordinate and supporting commands and multinational partners. Third, a “dynamic, shared plan” with implicit understanding maintained throughout the battlespace, increasing unity of effort and speed of command.

The “Interactive JPG” will be the focal point for all campaign planning. It will contain a core element from the JTF staff to direct the planning effort with respect to the JFC requirements. Information technology will allow the JPG to be globally interactive. It will be both collaborative and virtual organization. The JFC will continue to decide how the JPG is organized and who the representatives are but geographic location or organizational boundaries do not limit him. The JPG can be built to perform general and specific functions, taking advantage in real-time of the collective intellect distributed throughout the U.S. military and government. Liaison officers, Deployable Joint Task Force Augmentation Cell, component support cells and personnel augmentation will occur through technology and not with physical presence. World class subject matter expertise will be connected through the JPG and focused on the assigned mission. Listed below are some of the capabilities that may be required to enable joint planning.

- Knowledge management
- Intelligent software
- COA Analysis
- Network centric enterprise

The “Adaptive, Tailored Planning Process,” as the second element of JIP, will tie together the organization of the Interactive JPG and the final product of a Dynamic, Shared Plan. The crisis action process is a starting point to improve OODA performance utilizing the three elements of JIP. This planning process will be adaptive to the full range of military operations and tailored to the needs of the JFC and the mission assigned.

A “Dynamic, Shared Plan” is the last element of JIP. It will be the product of the Interactive JPG. Significant time delays in planning can result from subordinate and supporting commands not understanding the context in which requests for planning information are made. These same commands cannot realistically commence their own planning process until the plan is communicated and understood from above. Similar problems can also occur in execution. Planning technologies will permit planners to build a dynamic plan that is continuously updated as the situation requires. This plan will be shared through information technology throughout the battlespace. The plan is visible to all contributors as it is developed by the Interactive JPG. The assessments, COAs, intents and orders of the plan are built using technology that provides for

⁴ US Joint Forces Command, *A White Paper for Joint Interactive Planning (DRAFT)*, May 2000.

awareness and understanding of the JFC's complete intentions. Subordinate and supporting commands can contribute in parallel with the JFC plan and simultaneously plan their own requirements. Some capabilities that will be required include:

- Cognitive displays/Information sharing
- Multinational and non-governmental access
- Multi-level security
- Information assurance

2.3 Carrying Out That Course of Action

This function involves the communicative skills necessary to put the JFC's plans into action. The battlespace information system of the future will enable leaders to fuse the intuitive process with a science-based process in ways that might yield a much-improved visualization of the battlespace in time and space. This fusion will enable collaborative and simultaneous efforts from local and remote organizations to solve complex battlespace challenges. While organizations and staff may become more widely dispersed, their efforts will become more focused. The information system will be "born joint" and comprised of a set of interconnected communications and sensor grids, software applications and organizational structures. Some key requirements include establishing assured, reliable, redundant, quick, and secure communications. It includes new visual displays and processes, and commonality of symbols.

Some of these technologies will influence the way JTF HQs function by providing reachback capabilities. Today, even in small contingencies, the trend is to deploy large headquarters into a JOA. Everyone assigned or attached to the headquarters must deploy to the area, be housed, fed, and provided with basic services. They must be trained, and protected from a variety of possible threats including weather, disease, cyber attack, terrorists, angry mobs, small military forces, aircraft and/or missile attack. Facilities for personnel and their equipment must be procured and/or built, modified, equipped, and maintained. Systems must be transported, set up, linked, and maintained. This practice presents significant deployability, sustainment, and protection problems for the joint force and the supporting CINC, particularly in the early days of the crisis.

Reachback technologies will soon permit the JFC to leave major portions of his headquarters "behind", out of the JOA. This reachback capability will allow the JFC to deploy with a small staff to the JOA while maintaining constant connectivity to the bulk of his staff located "out of

This is particularly true with those staff functions designed to process and provide information rather than control immediate operations. Functional areas like logistics, administration, planning, and intelligence may be the first areas able to utilize reachback capabilities.

Eventually, the JFC will take into the JOA only the key leaders and staff whose presence is absolutely required. They would be connected to their counterparts in the rear headquarters, who would perform the majority of the work. Commanders, headquarters staff, and field commanders would "meet" their rear staff in a virtual environment for guidance, discussions, coordination, and clarification. This small staff will be able to travel throughout the JOA in a variety of ways including a mobile command post, onboard a ship, or operate from various fixed

locations. Through the capabilities offered in the CROP, these personnel will have immediate and reliable contact with the rear headquarters at all times. It will be as if they were co-located with the rest of the headquarters via video- and tele-communications.

2.4 Continuing to Assess the Unfolding Situation

Throughout the entire process, the JTF staff has to continually assess the situation. Information superiority technologies will facilitate the collection of most of this information. Based on feedback, the JFC may direct further action. Feedback, information synthesis, and presentation to the JFC are the essential mechanisms of control that allows the JFC to adjust and modify action as needed. Feedback may come from any direction and in any form. Feedback permits commanders to adapt to changing circumstances to exploit fleeting opportunities, to respond to developing problems, to modify plans, or to redirect efforts.

The information and knowledge gained during military operations is perishable. In the time required to gain new information, available information is already becoming obsolete. While the JFC strives to accumulate information about a particular situation, the opposition may already be reacting and readjusting. Often the opponent faces the reciprocal problem. The rapid tempo of modern operations limits the amount of information that can be collected, processed, and assimilated in time to be of use. The ensuing need of the JFC to balance the reduction of uncertainty with the pace and tempo of operations is the essence of the joint force C2 challenge.

3.0 How Information Superiority Can Change the Organization of a JTF Headquarters

Information superiority will provide us with entirely new ways to organize a headquarters for the joint force. US Joint Forces Command's concept "Adaptive Joint Command and Control"⁵ takes a look at several organizational options that may offer more effective, more efficient ways to form and operate a joint headquarters.

3.1 Standing Joint Force Headquarters.

First, rapid decisive operations will require a headquarters that can quickly adapt to the US military's capability for high-tempo, dispersed, lethal warfare. A Standing Joint Force Headquarters (SJFHQ) may be one answer. The SJFHQ would be a permanent organization to facilitate comprehensive crisis action planning and rapid response to contingencies across the range of military operations. This headquarters is "standing" because it is composed permanently of key assigned personnel who are equipped to plan, train for, and execute contingency operations.

Personnel in the SJFHQ can be used in one of three ways. First, the concept recognizes that not all contingencies will require a joint force headquarters. If the CINC assigns a component commander to handle a contingency (like a Noncombatant Evacuation Operation) then the SJFHQ may provide core plugs of equipment and people with special training to augment the

⁵ US Joint forces Command, Joint Experimentation Directorate "A White Paper for Adaptive Joint Command and Control", 30 Apr 00, is in draft form undergoing review and comment by the US Joint Forces Command staff.

component commander's staff. These core plugs will usually have specialized functions that the component commander's staff may not have. Second, the CINC may use the SJFHQ as the actual forward headquarters in a small-scale contingency like a peacekeeping or humanitarian operation. Third, if the contingency requires a major staff, the CINC may integrate the SJFHQ into his own, larger staff using the expertise and experience they bring with them. In the last two cases, the SJFHQ would most likely form the bulk of the JFC's forward headquarters.

During peacetime, members of the SJFHQ would train for all contingencies. For example, each month they might conduct an in-house exercise centered around a particular contingency. One month they might look at how they would perform humanitarian actions following a natural disaster. The next month they may look at ways to conduct rapid decisive operations. Over the years this organization will have built a comprehensive, detailed database of information and procedures for all contingencies. This database would be supplemented with lessons learned during actual operations and other exercises worldwide.

Databases would include information on ports and airfields, heavy engineering equipment, raw materials (like steel and concrete) of each nation. It would contain the capabilities and locations of hospitals, emergency services, fire departments and the police. It would contain the phone numbers of key contacts that may be able to help in humanitarian operations. The database would contain checklists that had been developed over time. The Checklist would insure key TTP and lessons learned were considered during operations. Overall, the database would be developed to hold pertinent information that may assist planners and commanders should a crisis develop quickly.

It is important to realize that the members in the SJFHQ do not work in isolation. When the organization trains, or performs actual operations, it includes selected augmentees from the CINC's staff and component headquarters; liaison officers from supporting CINC's staffs (like USSPACECOM, USTRANSCOM, and USJFCOM); and allied/coalition officers. Finally, depending upon the crisis, the SJFHQ could be augmented by personnel from government agencies, and/or PVO and NGOs. All of these people would be identified as SJFHQ augmentees/liaison personnel and trained to support the SJFHQ. They may be required to deploy with the SJFHQ or to provide support to it from the rear headquarters.

In addition, the SJFHQ could be supplemented by a Deployable Joint Force Augmentation Cell (DJFAC) made up of 20-30 members of the CINC's staff. Personnel identified as DJFAC members would provide special skills or traits that complement the SJFHQ. Many would have their own specialized equipment that would be configured for deployment if it was deemed necessary. Some potential career fields represented in the DJFAC may include medical, legal, admin, pol/mil, and communications personnel.

One of the principal tasks of the SJFHQ in peacetime would be the development and upkeep of contingency plans and possibly "living" courses of action. Advanced information systems will provide the capability to conduct military planning in an entirely new way. It will provide commanders and staffs with the ability to centralize their planning efforts while becoming less centralized in their locations. An abundance of accurate, comprehensive, and timely information will allow staffs at various locations to develop and coordinate a unifying plan of operations

focusing the actions of the force. The ability to rapidly exchange information around the globe will force the sequential, linear planning of the past to give way to simultaneous, interactive planning.

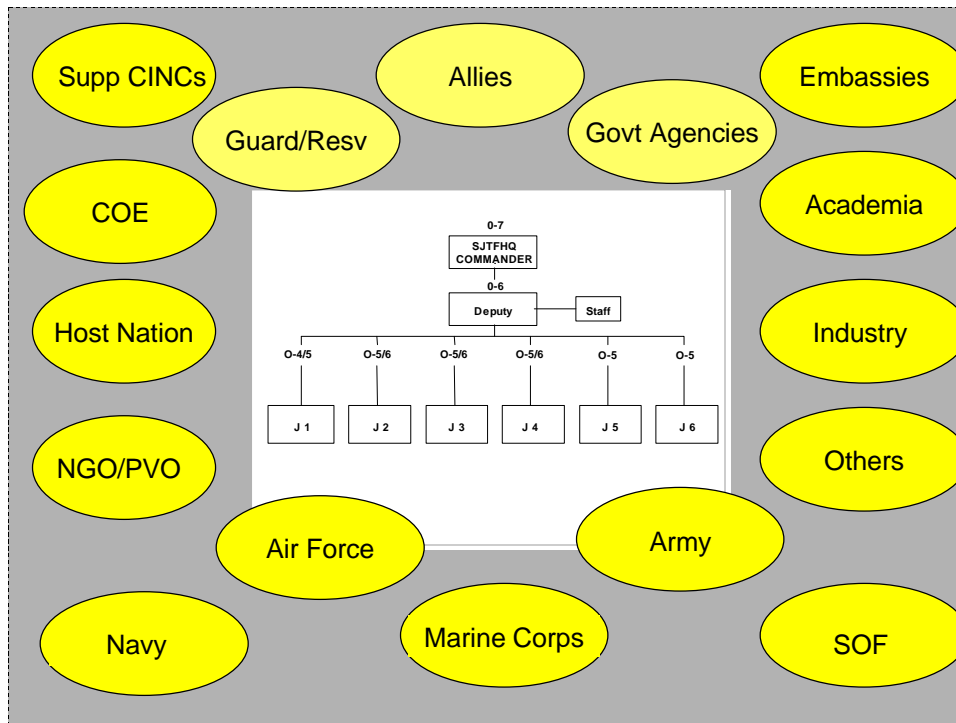


FIGURE 1

To do this, selected personnel in the SJFHQ, along with representatives from the component commands, will comprise a JPG. The JPG would be responsible for periodically modifying and maintaining contingency plans. Using joint interactive planning tools, plans would be “live” in that they would be constantly updated as circumstances called for them to change. Tied to simulations software, the plans could be displayed visually on monitors similar to computer wargames. TPFDD requirements would automatically update as units and/or requirements are changed.

If a crisis developed which could lead to US military involvement, SJFHQ planners and other JPG members would use joint interactive planning tools to build or modify crisis action plans (CAP) for the JFC and/or CINC. The early involvement of the JPG may provide the CINC some suggestions on how to shape the battlespace prior to hostilities, thus averting them.

Supporting personnel in the SJFHQ will be a suite of core command and control capabilities providing planning, execution, and monitoring tools for the mission essential tasks of force generation, force employment, force protection, and situational awareness. These are essential capabilities required by combatant commanders to accomplish their mission. In support of these

major mission essential tasks are a set of office automation tools, collaboration tools, modeling and simulation tools, shared data bases, and assessment tools.

Each SJFHQ would have the funds for, and be responsible for procuring its own communications and computer equipment and software. All SJFHQs would be held to a worldwide interoperability standard so augmenting forces could flow into any AOR and have immediate communications/computer access.

Much of the SJFHQ's equipment would remain with the rear headquarters; however some of it would be deployable to support the forward elements of the JTF HQ. Connectivity with the rear SJFHQ would be assured and reliable. Having trained for and planned the mission in peacetime, personnel in both the rear and forward SJFHQ would be able to assist the JFC in war or in any other operation efficiently and effectively.

Each SJFHQ will have personnel assigned to install, maintain, and train others on the various computers, communications, visual displays, and other assets. These cells will also help evaluate potential new equipment and software for possible joint acquisition efforts. This will insure the headquarters are kept current in the most modern, effective hardware and software.

3.2 Functional Headquarters Organization

Another way information technologies can affect the JF HQ's is by influencing its organizational architecture. Instead of organizing using the Napoleonic J1 through J6 style, perhaps a functional alignment would be more efficient and/or effective. A notional organization is presented in Figure 2.

The diagram shows a small forward JF HQ. Significantly, the JFC has his Joint Force Land Component Commander (JFLCC), the Joint Force Air Component Commander (JFACC), and his Joint Force Maritime Component Commander (JFMCC) with him in theater. Other key personnel could be included in the **Senior Commanders Board** such as the Commander, Special Operations Component (JFSOC). Members of the Senior Commanders Board would be component commanders, subordinate to the JFC. Working together in the small forward headquarters, these senior leaders would advise the JFC while commanding their component headquarters located out of the JOA. These senior leaders would each have a small support staff with them but relying on reachback technologies to direct their larger rear headquarters.

The JFC would have a small **Support Group** (not shown) to support him, which might consist of a legal officer, a comptroller, a chaplain, and/or someone from public affairs. The composition of the support group would vary depending upon the desires of the JFC.

There would be five major divisions in the JF HQ. An **Information Division** would combine many of the functions of today's J2, J6, and some of J3. This Division would be responsible for insuring the gathering, analyzing, and distribution of information. Among many of its tasks would be targeting, indications and warning, collection management, dissemination, defensive information operations, information support, computer support, networks, C2 operations, frequency control, and info plans.

The **Effects Division** would take the place of the present J3 and parts of the J2. This division would synchronize the “effects” of joint simultaneous air, naval, ground, and information operations be they lethal or non-lethal. Some of the cells within this division would include training and exercise, offensive information operations, joint targeting coordination, and joint fires cells.

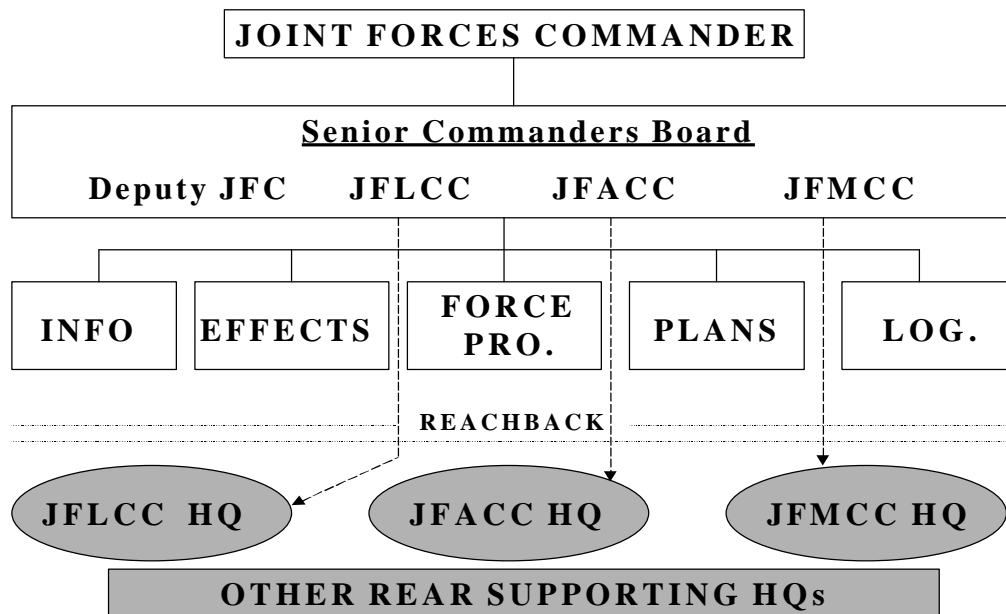


FIGURE 2

The **Force Protection Division** would be responsible for the overall protection of the force. This does not mean he is responsible for forward combat units, but he does coordinate the activities of the Area Air Defense Coordinator, the Rear Area Protection Coordinator, and the Navy Coastal Warfare Commander. The FPD would be responsible for threat warnings and recovery and restitution efforts if required. Additionally, the FDP would have the responsibility for the care and feeding of refugees and enemy prisoners of war.

The **Plans Division** is responsible for creating and updating all of the mobilization, deployment, employment, sustainment and redeployment plans for the JFC. The head of the Joint Planning Group would come from this division and be responsible for several planning cells including: crisis action planning, deployment, operations, orders, rules of engagement, etc.

The **Logistics Division** would be headed by the Joint Theater Logistics Manager who is responsible for the integration of all logistics support in theater. Under this concept, the Services retain their Title X responsibilities, but as joint force operations commence, theater distribution and allocation decisions will be managed by this division. Some of the cells in this division include maintenance, transportation, engineering, supply, joint movement, contracting, and current logistics operations.

The employment concept for this headquarters would go something like this:

- As a crisis begins to brew, the SJFHQ begins planning for possible contingency operations. This means doing research on the country/region, studying lessons learned from similar situations, and determining what forces could be used if necessary.
- As the crisis grows, the SJFHQ begins developing COAs under the JFC's guidance. Shortly, thereafter, the SJFHQ will have developed and tested (through simulations) the COAs, determined required forces, determined the forward headquarters structure, and developed a Time Phased Force and Deployment List (TPFDL). Personnel dedicated to be the rear headquarters, augmentees, liaison officers, and coalition partners would be trained on headquarters procedures and brought up to speed on the crisis.
- As soon as the "go-ahead" is given, the small forward SJFHQ would deploy with the first echelon of forces, providing C2 from the start. The rear headquarters would be functional and operating in the support role.
- Depending upon the crisis, the situation, and the JFC's desires, augmentees would be sent to the forward headquarters as needed. For example, there may be a real need for contracting officials, legal help, or public relations personnel. Generally though, the forward headquarters should be as small as possible.
- Many factors dictate the actual size and organization of the forward headquarters. A headquarters organized for humanitarian operations would be organized differently from a headquarters for warfighting.
- The size and organization of the headquarters would be adaptive. It may change in midstream as the situation demands. For example, what started out as a peacekeeping mission may suddenly change to one of refugee control, or NEO.

4.0 Experimentation

Joint Vision 2010, the conceptual template of the Chairman of the Joint Chiefs of Staff, mandates the need to achieve information superiority for our future military forces. The Joint Experimentation Directorate (J9) of the US Joint Forces Command is presently working three information superiority and command and control concepts. They are: the Common Relevant Operational Picture (CROP), Joint Interactive Planning (JIP), and Adaptive Joint Command and Control (AJC2). These concepts (along with others) will provide the basis for conceptual experimentation to proceed resulting in recommendations for changes in doctrine, organization, training and education, materiel, leadership, and personnel.

US Joint Forces Command J9 defines an experimentation strategy as a systematic and detailed plan of action encompassing methods to be adopted from beginning to end for evaluating a concept, focusing on general methods. This is contrasted with experimental design, which is defined as a plan for the process of data collection during some event to ensure capture of the information necessary to describe any interrelationships within the set of data that might exist. Thus, an experimentation strategy is a plan for investigating a concept, while an experimental design is a plan for the conduct of an experimental event. This distinction is critical, as concept-based experimentation, the US Joint Forces Command J9 approach to experimentation, is still so

new that there is little agreement among the many organizations involved on definitions and terms.

Initial efforts by the USJFCOM's CROP, JIP, and AJC2 Integrated Concept Teams (ICTs) responsible for the concepts addressed in the strategy focused on developing a separate experimentation strategy for each concept. After much consideration, the ICT members found that there were so many similarities, linkages, commonalties, and interrelationships between these concepts that it made good sense to develop a single integrated strategy for exploration of the three concepts. This integrated strategy greatly enhances the ability to plan experimentation efforts for these three concepts. The goal of the strategy is how to best explore ways CROP, JIP, and AJC2 facilitate, support, and enable a JFC to conduct operations such as Attack Operations Against Critical Mobile Targets (AOACMT) and Rapid Decisive Operations (RDO), priorities of US Joint Forces Command.

To achieve the advances described in the concept white papers, new approaches are required that include changes in technology, organization, doctrine and tactics, techniques and procedures (TTPs). Changing any of these elements individually will likely only result in incremental improvements in capability. True leap-ahead capabilities will only be achieved by developing new paradigms that incorporate organization and processes specifically designed to take maximum advantage of technological advances expected to be operationally available in the early 21st century. These new paradigms will be described for the three IS-C2 concepts in a set of alternative Concept of Operations (CONOPS). The IS-C2 Experimentation Strategy will describe how these alternative CONOPS will be evaluated through experimentation.

The IS-C2 Experimentation Strategy describes the concept experimentation efforts that implement the Joint Experimentation Process as articulated in the Joint Experimentation Campaign Plan 2000 (CPLAN 00). Through a series of successive or spiral activities, experimental results will be used to further define and refine the three concepts under study. The IS-C2 concepts will be modified based on the knowledge gained in the spiral events, then the revised concepts will be applied in later experimentation events using various scenarios to further refine and validate the concepts. These are followed by confirmatory experiments that seek to test the hypotheses, and finish with demonstrations of enhanced military capabilities.

The IS-C2 Experimentation Strategy establishes objectives that are to be addressed in the exploration and experimentation of the three IS-C2 concepts. The objectives articulated in the experimentation strategy serve as the focal points for exploring and validating concepts. These objectives provide the basis for IS-C2 questions that will be addressed through experiments ranging from narrowly focused Limited Objective Experiments (LOEs) to major joint exercises involving the CINCs, Services, and coalition partners. Along with each of the objectives and associated questions, the IS-C2 Experimentation Strategy provides brief descriptions of a set of experiments that J9 envisions will be needed to address the objectives.

The experiment strategy incorporates events, which span the spectrum of experimentation venues including seminars, workshops, wargames, controlled laboratory experiments, analytical studies, constructive simulations, virtual (man-in-the-loop) simulations, and live simulations.

Furthermore, real operations frequently provide a great opportunity to learn about specific concepts. Each of these venues offers advantages and disadvantages.

The IS-C2 Experimentation Strategy is a living document. Its development is a continuous process and updates will be published as necessary. As lessons from ongoing experiments are learned, the concepts, and thus the experimentation strategy, will be continuously reviewed and updated. The Joint Experimentation Directorate believes it must have the flexibility to redirect experimentation efforts in order to exploit newly found opportunities and drop those initiatives that fail to produce anticipated capabilities.

The IS-C2 concepts will be demonstrated in a major joint integrating experiment (MJIE) that will take place in 2004. The IS-C2 Experimentation Strategy will lay out an orderly progression of experimentation on the three IS-C2 theme concepts over the years 2000 to the 2004. The intent of the MJIE is to demonstrate the validity of the joint experimentation concepts to the warfighting community such that a decision might be rendered at that time to apply funding against the most promising aspects of the concepts.

5.0 Conclusion

New and improved technologies will expand the battlespace and compress the time commanders have to react to rapidly developing situations. While many of these technological advances in weapons, equipment, munitions, telecommunications and information processing provide improved capabilities to the joint force, they can, at the same time, challenge the JFC's ability to command and control joint forces and operations. JFCs must embrace technology and establish command and control processes and procedures that maximize the technological advantages of the joint force to achieve full-spectrum dominance.

The unqualified importance of information will not change. What will differ is the increasing access to information and improvements in the speed and accuracy of prioritizing and transferring data brought about by advances in information technologies. While the friction and the fog of war can never be eliminated, new technologies promise to mitigate their impact.

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